

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
24 February 2005 (24.02.2005)

PCT

(10) International Publication Number
WO 2005/018038 A2

(51) International Patent Classification⁷: H01M 10/04, 10/40, 10/48, 2/08, 4/02

(21) International Application Number: PCT/EP2004/009183

(22) International Filing Date: 16 August 2004 (16.08.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: 60/495,324 15 August 2003 (15.08.2003) US

(71) Applicant (for all designated States except US): PACIFIC LITHIUM NEW ZEALAND LIMITED [NZ/NZ]; 2 Mana Place, Manukau City, Auckland (NZ).

(72) Inventors; and

(75) Inventors/Applicants (for US only): DESILVESTRO, Hans [CH/NZ]; 16 Del Mar Court, Howick, Auckland (NZ). VAN VEEN, Casey, Ann [NZ/NZ]; 10 Ashland Place, Manurewa, Auckland (NZ). JIANG, Nancy, Lan [NZ/NZ]; 5-134 Onewa Road, Northcote, Auckland (NZ).

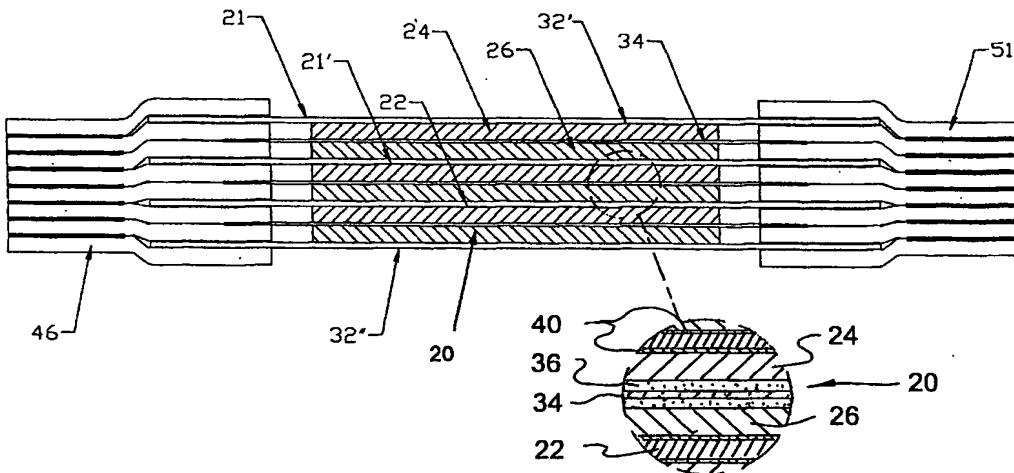
(74) Agents: OSTERTAG, Reinhard et al.; Ostertag & Partner, Eibenweg 10, 70597 Stuttgart (DE).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: RECHARGEABLE BIPOLE HIGH POWER ELECTROCHEMICAL DEVICE WITH REDUCED MONITORING REQUIREMENT



WO 2005/018038 A2

(57) Abstract: The present invention is drawn to a high power electrochemical energy storage device in a bipolar configuration, comprising at least n stackable cells (20) in bipolar configuration wherein subgroups of m cells are electronically monitored (63). The storage cells (20) have a lithium ion insertion anode (24) and a lithium ion insertion cathode (26), a separator (36), an electrolyte system (34), and a leak-proof seal structure (51). A number of embodiments are disclosed, characterized by a favorable range of m values, in combination with the anode-to-cathode capacity ratio, electrolyte conductivity, and other battery key features, thereby providing a high power device providing long cycle life and excellent power performance over many thousand charge and discharge cycles while minimizing the cost for electronic monitoring. Additionally, the present invention is drawn to a device combining two or more groups of stackable cells in bipolar configuration, either in series or in parallel or any combination thereof, so as to create a high power, high voltage energy storage device.



Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.